



United States  
Department of  
Agriculture

Combined Forest Pest  
Research and  
Development Program

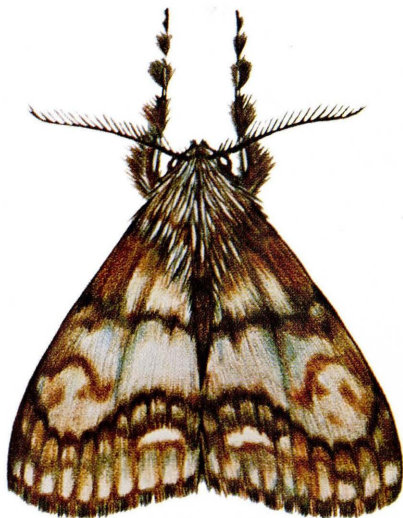
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## Douglas-Fir Tussock Moth Handbook

# You Could Spot the Next Tussock Moth Outbreak! Here's How



## **You Could Spot the Next Tussock Moth Outbreak! Here's How**

**by Jerald E. Dewey<sup>1</sup>**

In 1974 the U.S. Department of Agriculture initiated the Combined Forest Pest Research and Development Program, an interagency effort that concentrated on the Douglas-fir tussock moth in the West, on the southern pine beetle in the South, and on the gypsy moth in the Northeast. The work reported in this publication was funded in whole or in part by the Program. This manual is one in a series on the Douglas-fir tussock moth.

Trees attacked by the Douglas-fir tussock moth quickly lose their beauty. Treetops first become ragged and discolored, and some trees turn a bright rust color as needles are destroyed. Then small patches of injured trees may begin to show up in forested areas. In the later stages of a full-blown outbreak, hillsides are often covered with a sickly, brown mantle of dead trees. This happened in eastern Oregon and Washington, and northern Idaho in a major outbreak that occurred between 1972 and 1974. Over a million acres of Douglas-fir and true fir trees were damaged. Forest managers struggled with the problems of timber salvage and what the tussock moth damage would mean to wildlife habitat, loss of esthetic values in recreation and scenic areas, and increased hazard of forest fires.

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State and Private Forestry, Missoula, Mont.

## Caterpillars (Late May through July)

Can anything be done to prevent damage like this in the future? The answer is yes—and you are one of the keys! Long before an outbreak reaches epidemic proportions, there are numerous warning signs that could alert foresters to the problem—in time to do something to stop the outbreak. Sophisticated, scientific detection methods are being developed to help warn of the next tussock moth outbreak. But there are many telltale signs of an outbreak that people like you—woods workers and others who frequent forests—can spot before serious damage occurs. By keeping your eyes open and alerting forest managers, you can help save many board feet of timber, as well as esthetic values of the forest.

If you spot any of the following signs of increasing tussock moth populations, report them to the appropriate forest manager's office listed on pages 10-11.

Symptoms of tussock moth populations on the rise may include:

- Large numbers of caterpillars crawling or feeding on needles
- Cocoons and egg masses
- Silken "tents" in treetops
- Needles stripped from trees in urban or rural areas
- Ragged-looking treetops
- Small clusters of defoliated trees.



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Figure 1.—Newly hatched caterpillar.  
Figure 2.—Mature caterpillar.

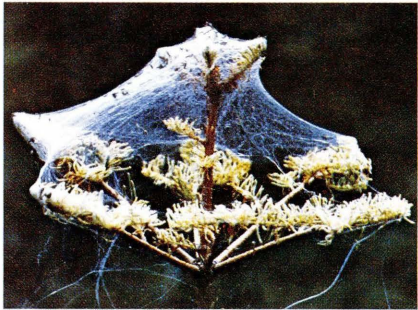
Even when tussock moth populations are low, woods workers such as timber inventory crews, trail crews, and loggers may find Douglas-fir tussock moth caterpillars on trees or even on clothing.

Hundreds of species of hairy caterpillars inhabit western forests, but the tussock moth caterpillar is quite easy to distinguish from most others. Newly hatched caterpillars (fig. 1) are gray or brown and about 1/8-inch long. As they feed and grow, they develop a set of four distinctive tufts of hair—usually a bright reddish brown—on their backs (fig. 2). Just behind the tufts is a bright yellow or red spot. Each caterpillar also has two black tufts on its head that very much resemble horns and a similar tuft on the other end of the body. Body color ranges from light cream to dark brown.

**Silken “Tents” in Treetops  
(May and June)**

Newly hatched tussock moth caterpillars often move into treetops, spin silken strands, and float on the wind to other feeding locations. When many caterpillars spin strands in the top of the same tree, conspicuous white silken tents are created. This may be the first sign of an outbreak. If you see such tents, check the foliage for caterpillars.

There are a number of other caterpillars that make tents, but most occur on hardwood trees rather than conifers.



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Figure 3.—Silken tent of the Douglas-fir tussock moth.  
Figure 4.—A tent caterpillar colony.



## Cocoons and Egg Masses (Late July and August)

At the end of the caterpillar stage, the insects form cocoons and become inactive. In about 10 to 14 days adult moths emerge. The wingless females remain on the cocoon, mate, and lay their eggs. Cocoons are usually securely attached to branches—near the treetop during low-level populations. Some cocoons contain mottled gray egg masses up to an inch long. Cocoons and egg masses are quite obvious to anyone cutting host trees.



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Figure 5.—Egg mass.

Figure 6.—Female tussock moth on cocoon.

## Defoliation of Trees in Urban or Rural Areas

Outbreaks of the Douglas-fir tussock moth in forests are often preceded a year or more by defoliation of ornamental or shade trees (spruce and fir) in urban or rural areas. For example, individual trees on farmsteads near Moscow, Idaho, were defoliated a year or two before widespread damage to forests occurred in the 1940's, 1960's and 1970's.



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Figures 7 and 8.—Defoliation of ornamental and shade trees in urban and rural areas.

## Ragged-Looking Treetops

Defoliation of treetops, especially in taller trees, is indication of a developing tussock moth outbreak. This is caused by large numbers of caterpillars feeding in the upper tree crowns. Damage is most apparent near the end of the feeding period—usually late July. This type of injury can be confused with damage caused by other defoliators such as the western spruce budworm, western hemlock looper, and false hemlock looper, which cause feeding injury throughout the tree with heaviest damage to tops. Tussock moth damage, in contrast, has a more distinct separation of the damaged and undamaged portions of Douglas-fir or true fir trees. Look for evidence such as caterpillars, cocoons, adults, eggs, or shed skins to aid in identification of the insect that is causing the problem.



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Figure 9.—Treetop defoliated by the Douglas-fir tussock moth.

Figure 10.—Treetop defoliated by another defoliator.



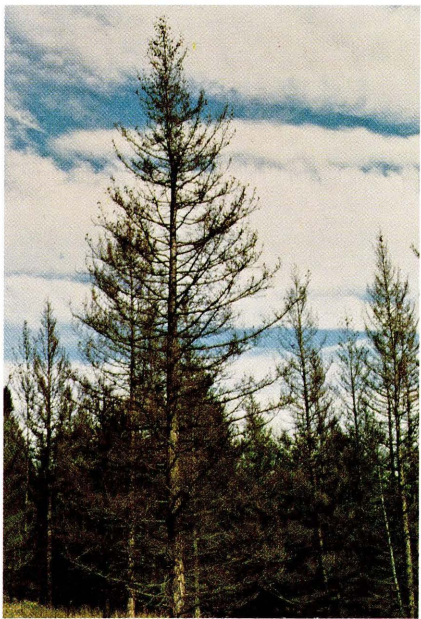
# Small Clusters of Defoliated Trees

Small clusters of severely defoliated trees often show up in the early stages of an outbreak. Complete defoliation of the trees within the cluster is common even though adjacent forest areas show no signs of feeding injury. This type of damage is characteristic of the Douglas-fir tussock moth.

When Douglas-fir trees are first defoliated, they turn a bright reddish brown. Later, as the injured needles die, the tree fades to grayish purple.



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Figure 11.—A small, severely defoliated tree cluster.  
Figure 12.—Individual trees in severely defoliated area.



## **How to Report a Suspected Outbreak**

Both State and Federal governments have forest management organizations trained to identify, evaluate, and suppress forest insect problems. At the State level, this responsibility resides with State forestry departments. The Forest Service has responsibility at the Federal level. Suspected outbreaks should be reported to these agencies. Insect samples should be sent to these agencies, if possible, with the following information:

- Name and address of persons reporting the damage
- Exact location of observed damage or infestation
- Date of observation
- Tree species involved
- Size of damaged area
- Landowner's name
- Any other pertinent information.

## Federal and State Organizations Responsible for Evaluating Forest Insect Problems

State	Federal Agencies	State Agencies
Arizona	Forest Insect and Disease Management U.S. Forest Service Federal Building 517 Gold Avenue, S.W. Albuquerque, N. Mex. 87102	Arizona State Land Department 1624 West Adams Phoenix, Ariz. 85007
California	Forest Insect and Disease Management U.S. Forest Service 630 Sansome Street San Francisco, Calif. 94111	State Department of Forestry 1416 Ninth Street Sacramento, Calif. 95814
Colorado	Forest Insect and Disease Management U.S. Forest Service 11177 West 8th Avenue P.O. Box 25127 Lakewood, Colo. 80225	Colorado State Forest Service Colorado State University Fort Collins, Colo. 80523
Idaho, northern	Forest Insect and Disease Management U.S. Forest Service Federal Building Missoula, Mont. 59801	Bureau of Private Forestry Division of Forest Resources Idaho Department of Lands P.O. Box 670 Coeur d'Alene, Idaho 83814
Idaho, southern	Insect and Disease Control Group U.S. Forest Service 1075 Park Boulevard Boise, Idaho 83706	Same as above
Montana	Forest Insect and Disease Management U.S. Forest Service Federal Building Missoula, Mont. 59801	Division of Forestry 2705 Spurgin Road Missoula, Mont. 59801

<b>State</b>	<b>Federal Agencies</b>	<b>State Agencies</b>
New Mexico	Forest Insect and Disease Management U.S. Forest Service Federal Building 517 Gold Avenue, S.W. Albuquerque, N. Mex. 87102	Department of State Forestry P.O. Box 2167 Santa Fe, N. Mex. 87501
Oregon	Forest Insect and Disease Management U.S. Forest Service 319 S.W. Pine Street P.O. Box 3623 Portland, Oreg. 97208	Department of Forestry 2600 State Street Salem, Oreg. 97310
Utah	Forest Insect and Disease Management U.S. Forest Service Federal Building 324 25th Street Ogden, Utah 84401	Utah Forestry and Fire Control 1596 W. North Temple Salt Lake City, Utah 84116
Washington	Forest Insect and Disease Management U.S. Forest Service 319 S.W. Pine Street P.O. Box 3623 Portland, Oreg. 97208	Department of Natural Resources Olympia, Wash. 98504
Wyoming, western	Forest Insect and Disease Management U.S. Forest Service Federal Building 324 25th Street Ogden, Utah 84401	Wyoming State Forestry Division 1100 W. 22nd Street Cheyenne, Wyo. 82001
Wyoming, eastern	Forest Insect and Disease Management U.S. Forest Service 11177 West 8th Avenue P.O. Box 25127 Lakewood, Colo. 80225	Same as above



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